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Does executive ownership lead to excess target cash? The case of U.K. firms

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Abstract

Purpose: The aim of this paper is to investigate the dynamics between executive ownership and excess cash policy in the U.K.

Design/methodology/approach: We identify firms adopting an excess policy using a joint criterion of high cash and cash higher than the target. Logit analysis is used to estimate the impact of executive ownership and other governance characteristics on the probability of adopting an excess cash policy.

Findings: Results suggest that, in the U.K., the impact of the executive ownership on the probability of adopting an excess cash policy is non-monotonic, in line with the alignment-entrenchment hypothesis. Our results are robust to different definitions of excess cash policy, to alternative specifications of the regression model, to different estimation frameworks and to alternative proxies of ownership concentration.

Research implications: Our approach provides a new measure of the excess target cash for the firm. We show the need to identify an excess target cash policy not only by using an empirical criterion and a theoretical target level of cash, but also by capturing persistence in deviation from the target cash level.

Originality/value: Actually, "how much cash is too much" is a question that has not been addressed by the literature. We address this question. Also, this amount of cash allows us to study the extent to which executive ownership contributes to explain the out-of-equilibrium persistency in the cash level.

JEL classification: G30, G32, G34.

Keywords: Excess cash policy, Managerial ownership, Corporate governance characteristics.

1. Introduction

The large increase in corporate cash holdings over the last three decades has drawn the attention of researchers on the determinants of corporate cash level. A strand of corporate finance theory refers to the manager-shareholder agency conflict in explaining why some firms choose to hold substantial cash reserves. Easterbrook (1984) and Jensen (1986) argue that self-interested manager values financial flexibility, which allows him/her to escape the capital market discipline. In trading-off investment and dividends versus financial flexibility, the manager tends to give higher weight to the latter by accumulating cash reserves. A relatively large empirical literature provides evidence that firms that are subject to the manager-shareholder agency conflict tend to hold more cash. Large cash holdings allow managers to consume large amounts of perks and/or to invest in negative net present value projects that provide personal diversification benefits at the expenses of shareholders (Myers and Rajan, 1998; Harford, 1999; Dittmar et al., 2003; Ferreira and Vilela, 2004; Pinkowitz et al., 2006; Kalcheva and Lins, 2007; Dittmar and Mahrt-Smith, 2007; Harford et al., 2008). Contrary to the majority of these studies, Mikkelson and Partch (2003) show that firms holding large amounts of cash do not perform any worse than other firms and high cash policies do not necessarily lead to value decreasing investments.

A number of studies has attempted to answer the long standing question in corporate governance about whether managerial ownership influences the firm cash policy. Corporate governance theory argues that, if interests of managers are different from those of shareholders, shareholders can use managerial ownership to make managers acting in the best interest of shareholders. It is suggested that, while at low levels managerial ownership ensures the alignment of managers and shareholders' interests, at high levels it may lead to managerial entrenchment (Jensen and Meckling, 1976; Morck et al., 1988; McConnel and

Servaes, 1990; Stulz, 1988; 1990; Jensen, 1993; McConnel et al., 2008). As a result, the corporate governance debate on the effects of managerial ownership has investigated the potential role of the alignment-entrenchment effect of managerial ownership on cash policy.

The existing literature provides mixed results. Some studies find an inverse relationship between managerial ownership and cash, while others find a positive or even a non-monotonic relationship between managerial ownership and cash levels. The vast majority of this research focuses on the U.S. economy (Opler et al., 1999; Dittmar et al., 2007; Harford et al., 2008; Akguc and Choi, 2013; Gao et al., 2013) despite the evidence that executive directors in the U.K. are the second-largest shareholders class (Florakis and Ozkan, 2009). The only exception which we are aware of is Ozkan and Ozkan (2004) that however focuses on the impact of the managerial ownership, not executive ownership, on the average cash level of U.K. firms. The underlying hypothesis is therefore that executive and non-executive directors respond to alignment and entrenchment effects in a similar way, although it is known that insider and outsider directors have different theoretical roles and financial incentives (Fama, 1980; Fama and Jensen, 1983). Also, a distinction between executive and non-executive equity stakes is especially important from the perspective of U.K. Corporate Governance guidelines (Cadbury 1992; Higgs, 2003), which have specified the financial relationship of executive and non-executive directors within the firm (Filatotchev, 2007).

Since U.K. shareholders prefer to compensate non-executive directors with cash rather than shares to protect their independence (Cadbury 1992; Higgs, 2003), we do not expect cash levels be significantly affected by non-executives' shareholdings. On the contrary, we expect it to be significantly affected by executive shareholdings (Florakis, 2005; Mura, 2007). In addition, while the Greenbury (1995) Report in the U.K. encourages executive directors to build up shares, the Company Act 1985 confers to executive directors with 5% voting stakes the power to propose counter-resolutions to resolutions proposed by other

shareholders and the obligation to disclose their strategic intent to shareholders only when their equity stake is between 5% and 15% of share capital. In light of this, we expect that outside this range executive directors might be more likely entrenched. There is, indeed, evidence that U.K. boards become entrenched at higher ownership levels than in their U.S. counterparts (Short and Keasey, 1999; Mura, 2007).

The interest in shares held by executive directors is also reinforced by the evidence that in the U.K. a lack of external market discipline and efficient monitoring by financial institutions causes executive directors more likely to be entrenched (Franks et al., 2001; Goergen and Renneboog, 2001). Differently from the U.S., the U.K. boards are dominated by executive directors (Vafeas and Theodorou, 1998; Pass, 2004) and non-executive directors have a more advisory, rather than a disciplinary, role (Franks et al., 2001; Petra, 2005). Coupled with a stronger minority investors' protection in the U.K., this discourages the shareholders' coalition and boosts the discretionary executives' power.

In this paper we shift our attention to U.K. firms and we examine the extent to which executive ownership, as a potentially effective mechanism of alignment of managers and shareholders' interests, reduces the adoption of an excess cash policy. We test the hypothesis that at low levels executive ownership aligns interests of executive directors to those of shareholders and reduces the probability of adopting an excess cash policy, whereas at high levels it entrenches executives and increases the likelihood of adopting such a policy. The lack of prior studies on the U.K. firms, coupled with a more dispersed firms' ownership structure and different corporate governance characteristics with respect to the U.S., makes the U.K. of particular interest. We focus explicitly on a group of firms that are likely to suffer from agency conflicts instead of examining the impact of executive ownership on the level of cash in the sample. To this aim, we define a sub optional amount of cash not only by using an empirical criterion and a theoretical target level of cash, but also by using a particular sample

period and by capturing persistence in deviation from the optimal cash level. Our approach provides us an empirical measure of the excess amount of cash for the firm. Actually, "how much cash is too much" is a question that has not been addressed by the literature; in turn, this amount of cash allows us to study the extent to which executive ownership contributes to explain the out-of-equilibrium persistency in the cash level.

To the above aim, we (1) isolate firms persistently holding more cash than the optimal and (2) we isolate firms holding more cash than the necessary because of agency conflicts (Jensen, 1986) from those holding cash because of precautionary motives (Myers and Majluf, 1984). We proceed along three lines. First, to analyse the impact of executive ownership on excess cash policy, we use observations over the 1990-2007 period. We exclude observations from 2008 onward as it is known that the financial crisis has significantly affected the firms' cash flow, and adverse shocks to cash flow are an important part of the managers' cash holdings decision especially when access to the capital market is costly (Bates, 2009; Brown and Petersen, 2011). Our choice is based upon preliminary evidence. The average cash to assets ratio of U.K. firms over the period 1990-2007 is about 13 percent. The financial crisis, beginning in the 2007, has caused a substantial increase in this level (up to 18.4 percent during the years 2007-2012). Moreover, as for the case of U.S. firms (Kahle and Stulz, 2013), during the crisis the cash to assets ratio for the U.K. firms shows an inverted U-shape path, with a sharp increase (19.7 percent) over the period 2007-2010 and a decrease (17 percent) during the years 2011-2012.

Secondly, since the finance literature shows that cash is related to some firm-specific characteristics, we include, as control variables, a large number of corporate governance mechanisms and precautionary motives that are likely to impact the decision about the cash policy (Kim et al., 1998; Opler et al., 1999; Gillan, 2006; Bates et al., 2009; Chen and

Chuang, 2009; McKnight and Weir, 2009; Kuan et al., 2011 and 2012; Kusnadi, 2011; Gao et al., 2013).

Third, to evaluate whether cash holdings are "abnormal" we estimate what the optimal cash holdings would be for the firm: "Ideally, we would have good theoretical models that would predict cash holdings given the known motivations for firms to hold cash. Unfortunately, such models do not exist" (Pinkowitz et al., 2013: 4). To provide a robust definition of cash in excess, we estimate an empirical model of optimal cash holdings commonly used in the literature (Opler et al., 1999; Bates et al., 2009; Gao et al., 2013), and we recover persistent deviations from optimal cash. This criterion is used jointly with existing empirical approaches and a new classification strategy, based upon the evolution of the distribution of cash holdings over time. Our results support the hypothesis that in the U.K. managerial incentives pass through executive ownership. Moreover, results are in line with the alignment-entrenchment hypothesis. They show a non-monotonic relationship between executive ownership and the probability of adopting an excess cash policy. We check our results for robustness in a number of directions. We adopt different definitions of excess cash. For robustness purposes we use alternative specifications of the regression model, pooled and panel data estimation frameworks, alternative proxies of ownership concentration, and we check for endogeneity problems.

The remaining of the paper is organized as follows: Section 2 presents the empirical methodology. Section 3 presents the data and the classification procedure. Section 4 discusses the empirical results and Section 5 concludes.

2. Empirical methodology

2.1. The empirical model

We estimate the following probability model:

$$(1)\quad \Pr\left(Excess\ cash_{i,p}\right) = f\left(Ownership_{i,p}\right) + \sum_{j=1}^{A} \beta_j Agency_{ji,p} + \sum_{j=A+1}^{J} \beta_j Precautionary_{ji,p} + \sum_{s=1}^{S} \gamma_s D_s + \sum_{p=1}^{P} \gamma_p D_p + \varepsilon_{i,p}$$

where $Excess\ cash_{i,p}$ equals one if firm i is classified as adopting the excess cash policy in panel p and zero otherwise; $f\left(Executive\ ownership_{i,p}\right)$ is function of the amount of outstanding shares held by managers; D_s are sector dummies ($S=10$); D_p are panel dummies ($P=6$); and $\varepsilon_{i,p}$ is the error term. The six panels are composed by three years each; the decision of building our approach upon panels instead of yearly observations is taken to capture persistency in the choice of the cash policy.

$Agency_{ji,p}$ is a set of A control variables to proxy for agency conflicts that are likely to influence the level of cash. According to the corporate governance literature, the shareholder can reduce agency costs by restructuring the board of directors or reshaping managerial incentives (Gillan, 2006). It is argued that the higher the board independence, that is the percentage of non-executive directors in the board, the less severe the agency conflicts between executive managers and shareholders as independent managers increase the boards' monitoring effectiveness which in turn decreases managerial opportunism (Mayers et al., 1997; Rosenstein and Wyatt, 1997; Holderness, 2003; Pass, 2004; Petra, 2005; Harford et al., 2008; Ameer et al., 2010; Sheikh and Wang, 2012; Jiraporn, 2012). Hence, we add the

percentage of non-executive directors in the board and the size of the board to the set of regressors. Moreover, the shareholder's incentive to monitor the manager it is known to depend on the shareholder's stake into the company. The larger the shareholder's stake, the greater is his/her incentive to play a role in the corporate control and reduce the scope for managerial opportunism (Shleifer and Vishny, 1986; 1997; Demsetz and Lehn, 1985; McConnel and Servaes, 1990; Pergola and Verreault, 2009). Ownership concentration is therefore a crucial variable in the analysis of managerial incentives and, to a certain extent, it can also exacerbate the firm's agency problems. On the one hand, larger stakes into the company allow major shareholders to have greater incentives to monitor managers; on the other hand, as the major shareholders gain control of the firm, they can generate private benefits that are not shared with minority shareholders (Shleifer and Vishny, 1997). Therefore, we add alternative measures of ownership concentration as control variables in the regression.

$Precautionary_{ji,p}$ is a set of *J-A* variables that proxy for precautionary motives to hold high cash. It is argued that firms can adopt high cash policies to cope with adverse income shocks, to reduce the firm's dependence on the costly external finance, and to have financial flexibility for potential profitable investment opportunities (Myers and Majluf, 1984; Kim et al., 1998; Opler et al., 1999; Graham and Harvey, 2001; Almeida et al., 2004; Han and Qiu, 2007; Gamba and Triantis, 2008; Bates et al., 2009; Riddick and Whited, 2009). There is evidence that older and larger firms are more likely to have easier access to capital markets and to face lower costs of temporary shortages in liquid funds (Hennessy and Whited, 2007; Hadlock and Pierce, 2010). In addition, firms paying dividends have lower benefits from holding cash as they cannot use cash in excess to face unexpected adverse shocks (Fazzari et al., 1988; Kim et al., 1998; Riddick and Whited, 2009). Previous research also suggests that the higher the firm's growth opportunities, the higher the need of

accumulating cash (Kim et al., 1998; Opler et al., 1999; Stein, 2003; Han and Qiu, 2007; Bates et al., 2009; Brown and Petersen, 2011). We therefore add age, size, dividend and market-to-book ratio to the set of regressors.

2.2. Hypotheses testing

The first hypothesis we test is that, as managerial ownership increases in the U.K., managers are less likely to adopt the excess cash policy since, to the extent that the alignment of interests is achieved, they are less likely to divert resources away from value maximization (Jensen and Meckling, 1976; Morck et al., 1988; McConnel and Servaes, 1990; Ozkan and Ozkan, 2004; Florakis and Ozkan, 2009; McConnel et al., 2008):

H_0^1: Other things being equal, higher managerial ownership aligns interests of managers and shareholders and the likelihood of adopting the excess cash policy reduces. We test for H_0^1 by imposing:

$$(2) \quad f\left(Ownership_{i,p}\right) = \alpha_1 Managerial\ ownership_{i,p},$$

to model (1), and test the hypothesis that $\alpha_1 < 0$.

The second hypothesis we test is that, if the manager holds a large fraction of shares, there exists an entrenchment effect. The corporate finance literature suggests that higher ownership gives managers a higher control over the firm and then less exposure to the external capital market disciplinary pressure (Stulz, 1988). Higher ownership, also, gives executives the opportunity to pursue their own agendas with lower threat of being replaced (McConnel and Servaes, 1990; Hermalin and Weisbach, 1991; Dittmar and Mahrt-Smith, 2007; Harford et al., 2008). Therefore, for sufficiently high levels of managerial ownership, the larger the amount of shares the managers hold, the more likely the policy of excess cash:

H_0^2: Other things being equal, for sufficiently high levels, managerial ownership misaligns interests of managers to those of shareholders and increases the likelihood of adopting the excess cash policy. We test for H_0^2 by imposing:

(3) $f(Ownership_{i,p}) = \alpha_1 Managerial\ ownership_{i,p} + \alpha_2 Managerial\ ownership_{i,p}^2$,

to model (1), and test the hypothesis that $\alpha_1 < 0$ and $\alpha_2 > 0$.

It is known that role and incentives of the executive directors are different from those of the non-executive directors - who are appointed in the shareholders' interests to perform monitoring over the executives (Rosenstein and Wyatt, 1997; Hermalin and Weisbach, 2003; Pass, 2004; Petra, 2005; Davies et al., 2005; Ameer et al., 2010; Sheikh and Wang, 2012).

Corporate finance studies, therefore, suggest that a broad classification of managerial ownership is not sufficient to assess managerial ownership as an adequate incentive mechanism (Pergola and Verreault, 2009). The effective monitoring is more likely if the ownership is concentrated in the hands of non-executive directors. Concentrated ownership in the hands of executives may in fact result in inefficient monitoring and sub-optimal financial policies if executives' interests are not aligned with those of the majority of shareholders.

However, mixed evidence is reported on the relationship between executive (insider) ownership and cash level. Ozkan and Ozkan (2004), using a sample of U.K. firms during the period 1984-1999, find a non-linear relationship between cash and managerial ownership, according to the idea that with increased managerial ownership managers avoid high cash policies (Jensen and Meckling, 1976). However, at very high levels of managerial ownership, managers can accumulate cash in excess for their own interests. Consistently with this, Harford et al. (2008) find a positive relationship between insider ownership and cash holdings for the U.S. firms, but the coefficient of insider ownership turns out to be significant only at the fourth quartile of the cash holdings distribution. They argue this suggests that the true

relationship between cash and managerial ownership may be asymmetric and non-linear. Therefore, the third hypothesis we test is the following:

H_0^3: Other things being equal, executive ownership aligns interests of executive managers to those of shareholders and reduces the likelihood of adopting the excess cash policy. For sufficiently high levels, executive ownership entrenches executive managers and increases the likelihood of adopting the excess cash policy. We test for H_0^3 by imposing:

$$(4)\quad f\left(Ownership_{i,p}\right) = \alpha_1 Executive\ ownership_{i,p} + \alpha_2 Executive\ ownership_{i,p}^2 + \alpha_1 Nonexecutive\ ownership_{i,p},$$

to model (1), and test the hypothesis that $\alpha_1 < 0$, $\alpha_2 > 0$ and $\alpha_3 = 0$.

3. Data and classification procedure

3.1. Data

Our sample of firms includes all publicly traded U.K. firms from DataStream for the period 1990 to 2007. We exclude from the sample financial firms and observations with missing firm-year figures for any variable included in the model. In addition, we do not use observations belonging to the period of the financial crisis as there is evidence that firms over this period have substantially raised the cash reserves. This may have caused both an increase in the number of cash rich firms and the precautionary motive being the main driver of an excess cash policy. If this is true, we expect that risk adverse managers would not have adjusted the level of firm cash further according to a change in their shares. Instead, in our paper we focus on the control of agency conflicts and the management of cash; in particular,

on how and whether shares may mitigate the agency conflicts between executive managers and shareholders and hence reduce the adoption of an excess cash policy. Finally, we choose only those firms with at least six continuous time series observations. These criteria provide us with an unbalanced panel of 1,196 firms and 14,317 firm-year observations.

The choice of analysing the U.K. economy is not without cost for data collection, as detailed information on board composition, managers' compensation and executive and non-executive ownership is not freely available. Ownership data are collected from many editions of the Price Waterhouse Corporate Register. Data on equity ownership are collected for each group of directors separately. We collect information on the size of the board, the ratio of non-executive directors in the board to the total number of directors, and ownership concentration. For the latter we build three alternative proxies: 1. the Herfindahl index, taken as the sum of the squares of outstanding shares held by all shareholders with at least 5 percent of the total shares; 2. the percentage of outstanding shares held by the largest shareholder; 3. the sum of the percentage of outstanding shares held by all shareholders with at least 5 percent of the total shares.

Descriptive statistics, reported in Table 1, show that the mean level of cash holdings of U.K. firms over the sample period is 13 percent. The median values regarding both the ownership concentration and the percentage of executive ownership are smaller than the mean values. This suggests that in the U.K. the level of executive ownership is quite moderate (Conyon and Sadler, 2005) and there is a strong protection of minority shareholders which prevents investors from holding large equity stakes.

<Insert Table 1 about here>

3.2. Classification scheme

In order to identify firms that are likely to divert financial resources away from value maximization, we define a firm as adopting the excess cash policy if it persistently holds high cash levels and it has cash in excess of its optimal level. Providing the theoretical definition is less challenging than providing its empirical counterpart as (1) there is no empirical definition of high cash the literature agrees upon; (2) the analysis has to take into account the theoretical requirement of cash; and (3) it is not straightforward to decide the time period that is long enough for the retention of cash to be considered as a persistent choice, and not as a random event.

We approach the question by borrowing from the existing literature the most common definitions of high cash firm. Harford et al. (2008) suggest to consider the firm as cash rich if it accumulates more cash than the median of the sector it belongs to. This approach relies upon the view that measures of centrality of the distribution for the sector contains information about the optimal requirement of cash by the firm operating in that particular sector. To capture persistency, we require that high cash firms positively deviate from the mean of the sector for a three year-period. To avoid overlapping observations, we split the entire time span in six panels using three years to build each panel (Table 2). Hence, the first group of high cash observations is the set of firms whose level of cash positively deviates from a constant sector mean. The mean of each sector is calculated using all available years for the sector. However, since the optimal sectorial requirement of cash may change over time, we obtain the second group of cash rich firms by allowing the mean of the sector to change across panels. We build the third group of cash rich firms by following the Mikkelson and Partch (2003) fixed rule approach according to which the firm is defined as being cash rich if it holds more than 25 percent of its assets in cash and cash equivalents over the required time span.

<Insert Table 2 about here>

We notice that the approaches above rely on information about centrality measures and some fixed classification criteria, without making use of information on clustering in the distribution of cash. Actually, research using the entire distribution of one variable suggests the use of its empirical shape to identify clusters of units. The underlying idea is that, if it there exists a group of observations behaving systematically different form others, these observations should be grouped around a mode located on the right tail of the distribution of cash (Bianchi, 1997). We take this suggestion on board and identify the fourth group of cash rich firms by allowing the distribution of the relevant variable to determine the cut-off point and the latter to change over time. We proceed as follows. First, we provide a statistical analysis based on the non-parametric estimate of the distribution of cash holdings. We estimate T densities of cash holdings, using the Gaussian Kernel and the Least-Squares Cross-Validation bandwidth (with T being the number of available years). Second, we define a firm as being cash rich if its cash holdings are higher than the last interior minimum of the cash holdings distribution for that year. Persistency is captured by requiring firms to be cash rich in the panel.

The criteria above are based on the empirical behaviour of cash and, hence, they do not exclude firms holding high cash because the high level of cash is optimal. Indeed, having high levels of cash does not necessarily imply that a firm is adopting the excess cash policy (Bates et al., 2009). The firm's optimal cash holding is the level of cash holding where marginal costs of cash just offset the marginal benefits (Kim et al., 1998). Therefore, we use the empirical model of optimal cash holdings, introduced by Opler et al. (1999), to estimate the theoretical target level of cash for each firm as:

$$(5)\quad Cash_i = \mu_1 Cash\ flow + \mu_2 Liquidity + \mu_3 Investment + \mu_4 Market - to - book + \mu_5 Leverage + \mu_6 Size + \sum_{s=1}^{S} \varphi_s D_s + \sum_{t=1}^{3} \gamma_t D_t + \epsilon_i,$$

where, $t \in p$, with *p=1...6*, *Cash* is the ratio of holdings of cash and cash equivalents to total assets; *Cash flow* is the ratio of pre-tax profits plus depreciation to total assets; *Liquidity* is the ratio of current assets minus current liabilities and total cash to total assets; *Investment* is the ratio of capital expenditures to total assets; *Leverage* is the ratio of total debt to total assets; *Market-to-book* is the ratio of book value of assets minus the book value of equity plus the market value of equity to book value of assets; *Size* is the logarithm of total assets in constant prices; D_s and D_t are sectorial and time dummies respectively.

To deal with the potential endogeneity of the variables, we average the independent variables over the first two years in the panel, and we take the dependent variable in the third year of the same panel. We use the estimated parameters from model (5) to calculate the target level of cash holdings, $Cash^*_{i,p}$ for each panel. Then, we calculate deviations of observed cash holdings from target values as:

$$(6)\quad \Delta Cash_{i,t} = Cash_{i,t} - Cash^*_{i,p}.$$

If the firm's cash holding positively deviates for all the years in the panel from its target level, we consider the firm as persistently holding more cash than it needs. We combine this information with each of the four empirical classification schemes to obtain the four groups of firms adopting the excess cash policy.

4. Empirical results

4.1. Classification results

Figure 1 presents examples that show the advantages of the analysis based on distributions. Panel A reports the estimate of the distribution of cash holdings for 2005 and Panel B for 1995. The solid lines represent the cut-off point for cash, where firms whose cash is located to the right of this point are said to adopt the excess cash policy for that year. For comparison purposes, the dotted line represents the splitting line resulting from the 25% fixed cash classification rule (FCCR25%). The distribution-based approach identifies a cut-off level of cash holdings corresponding to a lower ratio of cash holdings than the approach based on fixed rule. Results, reported in Panel B, also reveals that the two criteria can provide a significantly different splitting point.

<Insert Figure 1 and Table 3 about here>

Results from our classification exercises are reported in Table 3. The first seven rows show the total number of firm-year observations we have and the number of firms classified under each of the five classification schemes for the six non-overlapping panels. In this table, Column 1 reports the number of observations classified as having higher cash than the predicted target and Columns 2 to 5 report the observations under the four empirical methods. The five classification approaches lead to different results. More specifically, there is a substantial difference between the criterion based on a fixed rule and the classification scheme based on the shape of the distribution of cash holdings. When combining the theoretical approach with each of the four empirical methods, all the figures reduce - see the last seven lines of the table. This analysis provides the four groups of firms we define as adopting the excess cash policy that are the object of study in the remainder of the paper.

4.2. Preliminary evidence

Table 4 reports tests for difference in means for some of the variables we use in the analysis. Column 1 reports results for firms with excess cash according to the joint criteria of cash higher than the (constant) mean of the sector and cash higher than the theoretical target. Column 2 refers to observations defined with excess cash using the joint criteria of cash higher than the (time-varying) mean of the sector and cash higher than the target. Column 3 reports results for observations using excess cash according to both the 25% rule and to the theoretical target. Finally, Column 4 shows the results for observations classified according to the cluster analysis and to the theoretical target. Control samples are defined as observations not satisfying the corresponding classification criterion.

<Insert Table 4 about here>

By construction, the mean value of cash holdings for firms adopting the excess cash policy, using any of the four definitions, is significantly higher than that for firms in each of the control samples. There is little evidence that variables, which proxy for the presence of agency problems, differ from control firms. The evidence is different if the fixed classification rule is used. In this case, executive ownership and ownership concentration are significantly higher than in the control firms. These characteristics suggest that, under this criterion, the excess cash policy is likely to be driven by entrenched executives with high stakes in the firm or by major shareholders who expropriate the minority shareholders (McConnel and Servaes, 1990; Hermalin and Weisbach, 1991; Shleifer and Vishny, 1997, Kuan et al., 2012).

Results show that firms with cash in excess are younger, and have lower levels of leverage than control firms. This suggests that these firms accumulate cash because of precautionary motives or because of financing constraints (Kim et al., 1998; Brown and

Petersen, 2011). Moreover, the evidence shows that cash rich firms have a smaller number of non-executive directors on the board, and under the approach based on distributions, the non-executive directors have a lower amount of outstanding shares; in turn, this is likely to affect their ability of controlling the executives' opportunism.

Results from the classification exercise show that the approach based on the fixed classification rule tends to select small and young firms. Coupled with the size of the board being significantly lower than in the control firms, this suggests that the criterion tends to select a subsample of firms that is likely to be affected by precautionary behaviour of executives who are overly concerned with the firm's risk and consequently they favour a higher level of cash (Amihud and Lev, 1981; Friend and Lang, 1988; Berger et al., 1997). On the other hand, criteria based on the mean of the sector are able, only to a limited extent, to identify the firms we are interested in, as none of the ownership characteristics is statistically different from that associated to the control group.

4.3. Results

Table 5 reports our main results. We begin by presenting results based upon the most conservative choices with respect both to the classification criteria and estimators. Results are based upon the pooled logit model where the dependent variable is the probability of adopting the excess cash policy based on constant sectorial mean and positive deviation from the target cash level.

<Insert Table 5 about here>

Column 1 reports results of the test for the first hypothesis we test for. These suggest that the market-to-book ratio is positively associated with the probability of adopting the

excess cash policy. This is in line with the hypothesis that the greater the investment opportunities the greater the need of internal financing especially if financial markets are imperfect (Kim et al., 1998; Opler et al., 1999; Harford, 1999; Bates, 2009). Evidence suggests that the age of the firm is negatively associated to the probability of adopting the excess cash policy, in line with the idea that younger firms are more likely to face financing constraints and hence to accumulate cash to finance investments (Oliner and Rudebusch, 1992; Schaller, 1993; Brown and Petersen, 2011). Against this view is the evidence of an insignificant coefficient of firm size. However, this is due to the high correlation between age and size, as the latter happens to be statistically significant and with the expected sign if the former is excluded from the set of regressors (Kim, et al., 1998).

Also, results show that the higher the dividends the higher the likelihood of adopting the excess cash policy. This result may suggest that, if managers are themselves shareholders, they may prefer to accumulate cash in order to secure themselves a high dividend. Under this model, the coefficient associated to managerial ownership is statistically significant at 5% level, and it shows the expected sign. Therefore, results do not reject the hypothesis that managerial ownership aligns interests of managers to those of shareholders and reduces the probability of adopting the excess cash policy. In estimating the model in Column (2), we expand the set of regressors to include the squared managerial ownership and test for our second hypothesis. The coefficient for managerial ownership and its squared value are significant at 1% level and show the expected sign. Hence, the hypothesis that the impact of managerial ownership on the probability of adopting the excess cash policy depends on the level of managerial ownership is not rejected.

At low levels, the impact of managerial ownership is likely to be negative in support of the alignment hypothesis whereas, at high levels, it is likely to be positive in support of the entrenchment hypothesis. This result is in line with Ozkan and Ozkan (2004) according to

which, high managerial ownership prevents an efficient control of managers that can pursue their own objectives, as accumulating cash and consuming perquisites, without fearing discipline from other shareholders. For this reason, we use alternative definitions of ownership concentration. We replace the Herfindal index with the percentage of shares held by the largest shareholder, and with the sum of all shares held by shareholders having more than 5% of total shares. Columns (3) and (4) show that our main conclusions are robust to this exercise.

In Column (5) we report results from testing for our third hypothesis. We disentangle executive from non-executive ownership and add these to the set of regressors. The third hypothesis is not rejected: the estimated coefficient of executive ownership and its square are significant at 1% level. Signs are in line with expectations and consistent with our earlier findings of a non-monotonic relationship between managerial ownership and probability of adopting the excess cash policy. This conclusion is robust to the presence of the squared value of non-executive ownership in the set of repressors, and to alternative measures of ownership concentration - for the sake of space these results are not reported. Moreover, the coefficients of executive ownership and executive ownership square (in Column 5) are higher than those of managerial ownership and managerial ownership square (in Column 4). These findings, along with a non-significant coefficient of non-executive ownership, support our view that only executive ownership matters in the U.K. for cash policy. Given that the ratio of executive directors in the board is higher than that of non-executive directors (see Table 1) and the fact that rewards based on shares represent in the U.K. a lower percentage of the executive compensation with respect to the US (Conyon et al., 2011), it is important to analyse whether a rise in the executive ownership may reduce the degree of asymmetric information between executives and shareholders and affect the excess cash policy.

4.4. Robustness checks

We carry out a sensitivity analysis for robustness purposes. The first question we address is whether results are robust to the choice of the estimation framework (i.e. the pooled logit model augmented for sectorial and time dummies). We choose the pooled logit because a firm which adopts the excess cash policy in a panel does not necessarily need to do the same in the consecutive panels. Nevertheless, though when taking averages over the three years some observations are lost and data are not in a panel form, there is still a certain degree of persistency in the firm's behaviour so that firms keep adopting the excess cash policy for a certain time span. This suggests that adopting the excess cash policy may be a fixed characteristic and, if this is the case, sectorial dummies are not enough to control our results for the individual heterogeneity. As a consequence, we use a range of panel data frameworks (such as, the random-effect and the fixed-effect panel probability models) to re-estimate all the models presented in Table 5. In Table 6 we only report results for the third hypothesis tested via the random-effect probit model (Column 1) and the fixed effects logit model (Column 2). Results are largely consistent with those reported earlier.

<Insert Table 6 about here>

The second robustness check is related to the definition of the dependent variable. In estimating the model in column (3) the binary variable is set equal to one if the firm positively deviates both from the time-varying sectorial mean and from the optimal cash level; in estimating the model in column (4) we use the fixed classification rule along with the optimal cash level and, finally, in estimating the model in column (5) we adopt the distribution-based classification rule along with the optimal cash level. Conclusions about each of the null hypotheses are robust to these exercises. However, when the criteria using

either the fixed classification rule or the shape of the distribution of cash are used, the percentage of non-executive directors in the board is statistically significant with a negative sign. This supports the hypothesis that boards with a higher representation of non-executive directors are more effective in reducing managerial entrenchment (Borokhovich et al., 1996; McKnight and Weir, 2009). It is also worth to notice that these models have a significantly larger pseudo-R^2.

The third concern is related to the robustness of our results to the inclusion of the equilibrium determinants in the set of repressors. From the theoretical point of view the variables we use to determine the optimal amount of cash the firm holds should not necessarily enter the set of repressors. Alternatively, from an empirical perspective these variables should also be added to the set of regressors when testing our hypotheses since they are likely to be correlated both with the optimal amount of cash and with the deviation from such target. Results from this additional exercise are reported in Table 7 and show that the decision about rejection of the null hypothesis does not change even augmenting the models with this set of variables, either singularly or altogether.

<Insert Table 7 about here>

All the equilibrium determinants apart from the cash flow are statistically significant, and with the expected sign (see Opler et al., 1999). This suggests that variables determining the equilibrium level may impact the probability of adopting the excess cash policy with the same sign. The asymmetry we find in performing this robustness exercise suggests to perform the entire exercise after adding the level of executive ownership to the set of repressors when estimating the equilibrium level. Indeed, if ownership is omitted from the determinants of the optimal level of cash, then residuals from a cash regression that excludes ownership are likely to be correlated to this (omitted) variable. This can cause a spurious correlation between

excess cash and executive ownership. Therefore, we estimate the optimal level of cash by augmenting the Opler et al. (1999) model with executive ownership.

Finally, since shocks affecting the probability of adopting the excess cash policy are likely to affect some of the independent variables, we check our results for endogeneity issues. In this framework it is difficult to find a set of suitable instruments for each of the regressors; hence, we take advantage of the time structure of the data to control, to some extent, our results for endogeneity. To this aim, we repeat all the exercises by taking the average of the independent variables over the first two years of each panel, and using these as repressors in a model where the dependent variable is taken at the last year of the panel. Results from the last two exercises are largely consistent with those presented in Table 5 and are available upon request from the authors.

5. Conclusions

This paper tests the impact of executive ownership on the probability of adopting the excess cash policy in the U.K. We provide a definition of excess cash policy that relies on empirical criteria based upon both moments of the distribution of cash and fixed classification rules and eventual clustering in the distribution itself. We combine empirical criteria and classification rules with a theoretical target. Then, given the fact that U.K. boards are dominated by executive directors and rewards based on shares represent in the U.K. a lower percentage of the executive compensation with respect to the U.S., we examine the role of the executive ownership in the excess cash policy. In particular, we test the hypothesis that the alignment-entrenchment effect of managerial ownership exists, and that this effect goes through its executive component. Results suggest that the relationship between executive ownership and the probability of using an excess cash policy is non-monotonic. There is an alignment of interests between managers and shareholders at low levels of executive ownership and an

entrenchment at high levels that is likely to cause managers having more discretion to hoard cash reserves.

Our results suggest that U.K. firms adopting an excess cash policy have a higher executive ownership and a lower number of non-executive directors on the board, with respect to control firms. This evidence may suggest that firms have adopted excess cash policies because of executive ownership being possibly in the range where entrenchment becomes feasible. This is consistent with the evidence that in the U.K. non-executive directors and directors with large shares tend to entrench management by reducing board turnover (Franks et al., 2001).

It is also consistent with the evidence that, differently from the U.S., in the U.K. the ineffective implementation of fiduciary responsibilities results in non-executive directors playing a primarily advisory rather than a disciplinary role (Hermalin and Weisbach, 1991; Franks, 2001; Pass, 2004; Petra, 2005). Finally, this result is in line with the evidence that in the U.K. a lack of external market discipline and efficient monitoring by financial institutions makes executives more likely to be entrenched (Franks, 2001; Goergen and Renneboog, 2001).

This paper extends or encompasses several previous studies in considering the impact of the executive ownership on the probability of adopting an excess cash policy. Our findings have a number of implications for future research and practice. In particular, in this paper we provide a measure of the "excess target cash" for the firm by answering the question of "how much cash is too much". As a result, if cash rich firms identified by previous studies were actually firms with "normal" levels of cash, then the interpretation of previous results would be decisively under question. Moreover, our evidence suggest that researchers should take into account that the number of firms classified as adopting an excess cash policy may depend on the criterion (theoretical and/or empirical) they use to identify those firms. Also,

our measure of excess cash policy allows identifying, in practice, levels of cash which are "abnormal" with respect to an "equilibrium level" and how financial and governance variables contribute to explain the out-of-equilibrium persistency in the cash level. In particular for the U.K, our findings suggest that, if U.K. firms have adopted excess cash policies because of a poor governance system, then U.K. firms should be cautious in using executive ownership as a corporate governance mechanism: managerial ownership seems to be a controversial corporate governance mechanism to motivate managers, as it may enter the range where entrenchment becomes feasible and generates suboptimal cash holdings and firm value.

Our findings also validate that firms using an excess cash policy are younger and have a lower level of leverage than that of control firms. This indicates that an excess cash policy might be driven not only by poor corporate governance, but also by the interplay between agency costs of managerial opportunism and cost of the external finance. In particular, it is known that investors will charge a higher cost of external finance for firms whose managers are thought to waste or use funds inefficiently (Huang et al., 2009). Therefore, when a substantial increase in the executive ownership introduces an alignment effect, investors will charge the firm a lower cost of external finance (Huang et al., 2009). This in turn will increase the ability to raise debt and will decrease both the need of accumulating cash holdings and the sensitivity of investment to cash holdings. However, at high level of managerial ownership, a further increase in managerial shares may create an entrenchment effect and therefore an increase in the cost of external finance for taking the severe agency risk, which will decrease the ability to raise debt and will increase both the need of accumulating cash holdings (Dittmar, Mahrt-Smith, and Servaes, 2003) and the sensitivity of investment to cash holdings. In an effort to control parameters for the impacts other than those we are interested in, we have kept constant variables measuring both the cost of

external finance and the degree of agency problems. However, these impacts are interdependent and disentangling these effects on cash policy is challenging due to a paucity of valid instruments and accurate proxies for important variables. Further research is therefore needed to take into account this kind of endogeneity and explore alternative explanations of our findings.

Finally, the dangers of a high-risk culture in finance were uncovered in the recent crisis and have affected firm capital structure and therefore the target level of cash. Our approach, which takes into account the evolution of cash distribution over time, can be used to explore whether excess cash holdings of U.K. firms and the impact of managerial ownership on this excess target have changed from before the crisis to after the crisis.

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Table 1
Descriptive Statistics

The descriptive statistics are presented on the basis of six non-overlapping panels.

	Min	25%	Median	Mean	75%	Max
Cash Holdings	0.00	0.02	0.07	0.13	0.14	0.94
Leverage	0.00	0.08	0.16	0.18	0.25	1.00
Market-to-Book	0.20	1.03	1.33	1.62	1.81	9.89
Cash Flow	-2.00	0.05	0.09	0.07	0.13	1.40
Liquidity	-2.00	-0.07	0.04	0.04	0.16	0.61
Size	3.44	9.51	10.54	10.84	11.96	18.40
Profitability	-2.00	0.08	0.13	0.11	0.18	0.42
Dividend	-2.00	0.09	0.16	0.15	0.23	1.12
Cap_Ex	0.00	0.04	0.06	0.08	0.10	0.68
Fixed Assets	0.00	0.19	0.32	0.36	0.48	0.95
Age	0.00	4.00	7.00	9.15	12.00	17.00
Executive Ownership (%)	0.00	0.20	2.68	10.72	15.12	83.43
Nonexecutive Ownership (%)	0.00	0.02	0.17	2.55	1.60	67.23
Block Ownership (>5%)	0.00	9.30	21.20	23.83	35.03	100.00
Largest Owner (%)	5.00	10.09	14.68	19.04	22.92	100.00
Herfindahl	294.55	398.58	571.33	873.48	945.22	7505.21
Board Size (log)	0.00	1.70	1.95	1.93	2.14	3.09
Nonexecutive Directors (%)	0.00	0.31	0.42	0.41	0.50	1.00

Table 2
Panel Formation

In each panel, each firm has three years of complete information on each variable. Firms are required to survive at least six years, two non-overlapping periods, throughtout the sample period 1990-2007.

Panel	A	B	C	D	E	F
Years	[1990-1992]	[1993-1995]	[1996-1998]	[1999-2001]	[2002-2004]	[2005-2007]

Table 3
Distribution of Firms Across Panels under Alternative Classification Schemes

Column marked as Total gives the number of observations per panel. Column 1 is for firms holding higher cash stocks than the estimated target for all years in a panel. Column 2 is for firms holding more cash than the mean of the sector they belong for all years in a panel, where the mean is constant over time. Column 3 is for firms holding more cash than the sectoral mean for all years in a panel, where the mean changes across panels. Column 4 is for firms having a cash holding-total assets ratio higher than 25% for all years in a panel. Column 5 is for firms whose their cash holdings is bigger than the last interior minimum of the cash holdings distribution for all years in a panel.

			1	2	3	4	5
	Panel	Total	Cash Higher than Estimated Optimum	Constant Mean Rule	Time-Varying Mean Rule	25% Rule	Distribution Rule
A	1990-1992	147	62	34	47	3	5
B	1993-1995	489	190	151	159	26	41
C	1996-1998	878	347	302	316	63	91
D	1999-2001	950	357	365	343	58	90
E	2002-2004	1004	365	391	367	66	89
F	2005-2007	793	295	271	278	55	59
All Panels		4261	1616	1514	1510	271	375

			1 & 2	1 & 3	1 & 4	1 & 5
A	1990-1992	147	25	34	3	5
B	1993-1995	489	108	116	25	40
C	1996-1998	878	219	228	62	87
D	1999-2001	950	265	255	57	87
E	2002-2004	1004	262	256	65	86
F	2005-2007	793	192	192	54	58
All Panels		4261	1071	1081	266	363

Table 4
Test for Difference in Means

Column 1 reports results from the classification scheme using the constant mean of the sector the firm belongs to and positive deviations from optimal cash. Column 2 reports results from the classification scheme using the time varying mean of the sector the firm belongs to and positive deviations from optimal cash. Column 3 reports results from the classification scheme using the 25% constant rule and positive deviations from optimal cash. Column 4 reports results from the classification scheme using last interior minimum of the cash distribution and positive deviations from optimal cash. E.C. stands for Excess Cash. ***, **, and * indicate that the null hypothesis of equality of means is rejected at the 1%, 5%, and 10% confidence level.

Variables	1 Constant Mean Rule & Cash Higher than Optimum		2 Time-Varying Mean Rule & Cash Higher than Optimum		3 25% Rule & Cash Higher than Optimum		4 Distribution Rule & Cash Higher than Optimum	
	Control	E.C.	Control	E.C.	Control	E.C.	Control	E.C.
Cash Holdings	0.059	0.253	0.059	0.255	0.085	0.465	0.068	0.299
t-value	39.91***		40.24***		40.76***		37.87***	
Leverage	0.195	0.135	0.195	0.134	0.187	0.074	0.193	0.117
t-value	-12.67***		-12.77***		-14.80***		-14.54***	
Size	10.838	10.850	10.841	10.841	10.898	9.976	10.850	10.796
t-value	0.17		-0.01		-8.25***		-0.67	
Age	9.326	8.627	9.339	8.584	9.305	6.806	9.318	8.351
t-value	-2.83***		-3.05***		-7.65***		-3.53***	
Executive Ownership	10.667	10.885	10.566	11.184	10.433	15.189	10.568	11.436
t-value	0.30		0.86		3.12***		1.02	
Nonexecutive Ownership	2.607	2.386	2.602	2.404	2.533	2.859	2.634	2.167
t-value	-0.85		-0.77		0.67		-1.80*	
Block Ownership (>5%)	23.863	23.715	23.868	23.701	23.746	25.058	23.857	23.682
t-value	-0.19		-0.21		0.88		-0.21	
Largest Owner	18.920	19.397	18.884	19.496	18.782	22.882	18.943	19.482
t-value	0.77		0.98		2.98***		0.75	
Herfindahl	866.89	893.81	863.76	902.82	857.90	1127.72	871.10	884.78
t-value	0.68		0.98		2.73***		0.3	
Board Size	1.923	1.933	1.923	1.933	1.930	1.857	1.925	1.931
t-value	0.63		0.65		-2.52***		0.37	
Nonexecutive Directors	0.414	0.406	0.413	0.407	0.415	0.370	0.414	0.400
t-value	-1.07		-0.87		-2.98***		-1.65*	

Table 5
Main Results

All models refer to the definition of excess cash policy based on sectoral constant mean and positive deviation from optimal cash. In all models, i is the observation and p is the panel. In models (1) and (2) Ownership Concentration is measured as the Herfindahl index; in model (3) Ownership Concentration is the percentage of shares of the largest shareholder; in model (4) and (5) it is defined as the sum of all shares for shareholders having more than 5% of shares. All models are estimated by means of a pooled logit model, including panel and sectoral dummies, where i is the observation and p is the panel. t-statistics are reported in brackets. ***, **, and * indicate that the coefficient is significant at the 1%, 5%, and 10% confidence level.

Variables	(1)	(2)	(3)	(4)	(5)
Constant	-2.350 (-3.47)***	-0.808 (0.24)	-1.928 (-2.70)***	-1.843 (-2.51)**	-1.892 (-2.59)***
Size	-0.031 (-0.74)	-0.065 (-1.46)	-0.069 (-1.53)	-0.059 (-1.28)	-0.059 (-1.29)
Market-to-Book	0.381 (7.61)***	0.384 (7.65)***	0.369 (7.44)***	0.368 (7.46)***	0.374 (7.56)***
Age	-0.018 (-2.27)**	-0.019 (-2.41)**	-0.013 (-1.69)*	-0.019 (-2.41)**	-0.019 (-2.38)**
Dividend	1.743 (5.21)***	1.698 (5.08)***	1.958 (5.92)***	1.972 (6.06)***	1.970 (6.06)***
Board Size	0.132 (0.60)	0.167 (0.76)	0.188 (0.86)	0.103 (0.49)	0.114 (0.53)
Nonexecutive Directors	-0.237 (-0.60)	-0.328 (-0.82)	-0.378 (-0.99)	-0.487 (-1.31)	-0.465 (-1.18)
Ownership Concentration	$4.31e^{-5}$ (0.64)	$-2.35e^{-5}$ (-0.32)	$-3.03e^{-5}$ (-0.64)	$4.07e^{-5}$ (0.12)	$2.36e^{-5}$ (0.07)
Managerial Ownership	-0.009 (-2.26)**	-0.034 (-3.31)***	-0.033 (-3.44)***	-0.034 (-3.52)***	
Managerial Ownership^2		$4.54e^{-4}$ (2.68)***	$5.10e^{-4}$ (3.38)***	$4.99e^{-4}$ (3.44)***	
Executive Ownership					-0.036 (-3.52)***
Executive Ownership^2					$5.81e^{-4}$ (3.67)***
Nonexecutive Ownership					-0.012 (-1.28)
Pseudo-R^2	0.047	0.049	0.051	0.051	0.053

Table 6
Robustness to the Estimation Framework and Classification Schemes

Model (1) is estimated by means of a random effect probit model. Model (2) is estimated by means of a fixed effects logit model. Models (3), (4) and (5) are estimated by means of a pooled logit model. All models include time and sectoral dummies except from model (2) which includes time dummies only. Model (3) refers to the definition of excess cash policy based on sectoral time varying mean and positive deviation from optimal cash. Model (4) refers to the definition of excess cash policy based on fixed 25% cash holdings and positive deviation from optimal cash. Model (5) refers to the definition of excess cash policy based on the shape of the cash distribution and positive deviation from optimal cash. t-statistics are reported in brackets. ***, **, and * indicate coefficient is significant at the 1%, 5%, and 10% confidence level.

Variables	(1)	(2)	(3)	(4)	(5)
Constant	-1.324 (-1.70)*		-2.080 (-2.85)***	0.747 (0.70)	-2.433 (-1.92)*
Size	-0.044 (-0.88)	-0.059 (-1.29)	-0.049 (-1.07)	-0.270 (-3.60)***	-0.169 (-2.66)***
Market-to-Book	0.270 (5.53)***	0.373 (7.55)***	0.407 (8.22)***	0.492 (7.66)***	0.472 (8.15)***
Age	-0.021 (-2.24)**	-0.019 (-2.38)**	-0.019 (-2.44)**	-0.041 (-2.55)**	-0.026 (-2.11)**
Dividend	1.065 (4.15)***	1.967 (6.06)***	2.095 (6.44)***	2.684 (5.54)***	2.690 (6.27)***
Board Size	-0.070 (-0.34)	0.114 (0.53)	0.089 (0.42)	0.179 (0.53)	0.028 (0.10)
Nonexecutive Directors	-0.010 (-0.03)	-0.464 (-1.18)	-0.546 (-1.39)	-1.476 (-2.35)**	-1.253 (-2.33)**
Ownership Concentration	$3.41e^{-4}$ (0.11)	$2.35e^{-4}$ (0.07)	$2.35e^{-3}$ (0.72)	$4.24e^{-3}$ (0.80)	$2.76e^{-3}$ (0.61)
Executive Ownership	-0.022 (-2.14)**	-0.036 (-3.51)***	-0.034 (-3.28)***	-0.032 (-2.07)**	-0.024 (-1.99)**
Executive Ownership^2	$3.69e^{-4}$ (2.34)**	$5.81e^{-4}$ (3.67)***	$5.55e^{-4}$ (3.54)***	$5.49e^{-4}$ (2.41)**	$4.09e^{-4}$ (2.19)**
Nonexecutive Ownership	-0.007 (-0.8)	-0.012 (-1.27)	-0.010 (-1.11)	-0.007 (-0.53)	-0.007 (-0.50)
Pseudo-R^2	-	-	0.057	0.135	0.111

Table 7
Robustness to Equilibrium Determinants

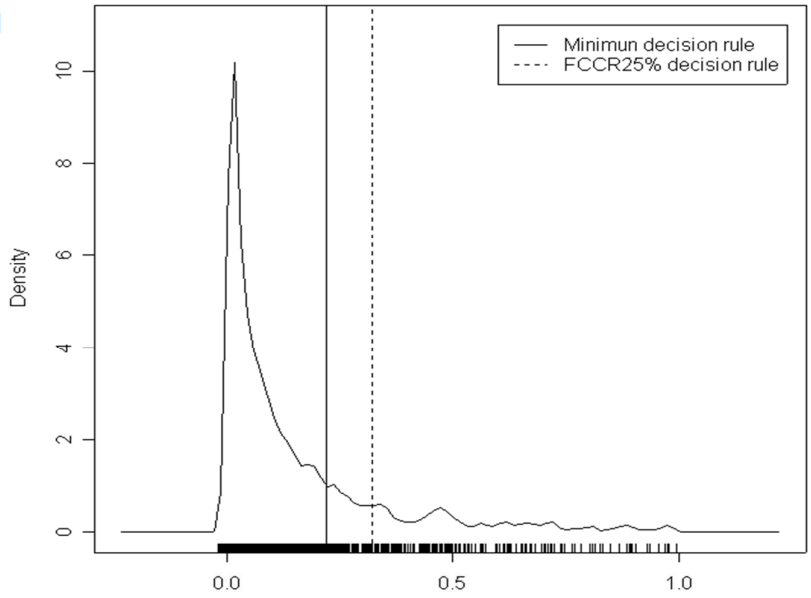
All models refer to the definition of excess cash policy based on sectoral constant mean and positive deviation from optimal cash and are estimated by means of a pooled logit model, including panel and sectoral dummies, where i is the observation and p is the panel. t statistics are reported in brackets. ***, **, and * indicate coefficient is significant at the 1%, 5%, and 10% confidence level.

Variables	(1)	(2)	(3)	(4)	(5)
Constant	-1.860 (-2.54)**	-1.695 (-2.32)**	-1.603 (-2.18)**	-1.872 (-2.51)**	-0.767 (-1.01)
Size	-0.062 (-1.35)	-0.044 (-0.97)	-0.070 (-1.53)	0.033 (0.70)	0.016 (0.34)
Market-to-Book	0.370 (7.41)***	0.404 (8.04)***	0.335 (6.60)***	0.309 (5.94)***	0.263 (4.80)***
Age	-0.019 (-2.40)**	-0.020 (-2.55)**	-0.018 (-2.24)**	-0.018 (-2.27)**	-0.016 (-1.98)**
Dividend	1.915 (5.77)***	1.882 (5.83)***	1.989 (6.12)***	1.306 (4.16)***	1.100 (3.56)***
Board Size	0.111 (0.52)	0.107 (0.50)	0.112 (0.52)	0.042 (0.19)	0.010 (0.04)
Nonexecutive Directors	-0.455 (-1.15)	-0.427 (-1.08)	-0.481 (-1.22)	-0.076 (-0.19)	-0.054 (-0.13)
Ownership Concentration	$1.11e^{-4}$ (0.52)	$-4.63e^{-4}$ (-0.14)	$-8.89e^{-5}$ (-0.03)	$-9.80e^{-4}$ (0.30)	$-9.83e^{-4}$ (-0.29)
Executive Ownership	-0.037 (-3.54)***	-0.034 (-3.23)***	-0.037 (-3.55)***	-0.033 (-3.12)***	-0.031 (-2.88)***
Executive Ownership^2	$5.82e^{-4}$ (3.67)***	$5.44e^{-4}$ (3.41)***	$5.97e^{-4}$ (3.74)***	$5.43e^{-4}$ (3.39)***	$5.25e^{-4}$ (3.19)***
Nonexecutive Ownership	-0.012 (-1.28)	-0.011 (-1.13)	-0.013 (-1.35)	-0.016 (-1.71)*	-0.015 (-1.46)
Cash Flow	0.353 (0.78)				0.290 (0.59)
Capital Expenditure		-6.323 (-5.57)***			-7.878 (-6.35)***
Liquidity			-1.029 (-3.50)***		-2.336 (-7.06)***
Leverage				-4.621 (-8.80)***	-5.009 (-9.66)***
Pseudo-R^2	0.053	0.066	0.057	0.087	0.117

Figure 1
Examples of Cash Holdings Densities

Estimates are obtained by using a Gaussian Kernel and the Least-Squares Cross-Validation bandwidth. Panels A and B show the cash holdings distribution in 2005 and 1995 respectively. The fixed classification ratios for cash holdings, FCCR25%, are also denoted on each distribution for comparison purposes.

Panel A



Panel B